

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

After entry of the foregoing amendment, Claims 1-26 are pending in the present application. Claims 1-22 are amended and Claims 23-26 are added by the present amendment without introduction of new matter.

In the outstanding Office Action, Claims 1-5, 7, 9-11, and 16-18 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,320,185 B1 to Matsuo in view of U.S. Patent No. 5,612,544 to Busch, and further in view of U.S. Patent No. 5,332,895 to Rieder; Claims 13-15 and 20-22 were allowed; and Claim 6, 8, 12, and 19 were indicated as allowable.

Applicants thank the Examiner for the allowance of claims and indication of allowable subject matter, summarized above. In view only of that indication, dependent Claims 6, 8, 12, and 19 are amended to rewrite those claims in independent form, and are not amended to overcome any rejection or to distinguish those claims over an applied reference. Further, allowed Claims 13-15 and 20-22 are amended to address cosmetic matters of form or to better differentiate the statutory scope of the claimed elements. Accordingly, Applicants respectfully submit that Claims 6, 8, 12-15, and 19 are now and/or remain in condition for allowance.

Addressing now the rejection of Claims 1-5, 7, 9-11, and 16-18, summarized above, that rejection is respectfully traversed.

Amended Claim 1 is directed to a rotational phase difference detecting system for detecting at a rotational phase difference between a plurality of rotating bodies. The system includes:

a first rotating body with a first mark;

a second rotating body with a second mark;

a mark sensor configured to detect said first mark; and

a first camera configured to image said second mark when said mark sensor detects said first mark; and

a display section configured to display said second mark imaged by said first camera,

wherein a rotational phase difference between said first and second rotating bodies is detected from a position of an image of said second mark displayed on said display section.

Amended independent Claims 7 and 16 recite features similar to those discussed below with respect to amended Claim 1.¹ The remaining claims depend directly or indirectly from Claims 1, 7, and 16.

By way of background, Figure 8 illustrates a color offset rotary printing press for performing color printing.² If the rotating printing rollers 83, 73, 63, 53 (which transfer blue, red, yellow, and black images to the paper) fall “out-of-register”, then the image portions intended to be transferred to the same location of the paper are inadvertently shifted apart from one another.³ Such register problems may be addressed by detecting phase differences between the rotating printing rollers 82, 73, 63, 53.⁴

In a non-limiting example, Figure 1 illustrates an embodiment of the claimed invention. When the mark sensor 4 detects light reflected from the reference mark 12 of the reference printing roller 13, a detection signal is output to the image processing section 6.⁵ The detection signal causes the stroboscope to irradiate the printing roller 11, which permits the image processing mark 10 to be imaged by the microlens 1.⁶ Thus, when the mark sensor

¹ As none of the claims have been amended to distinguish over the applied references, Applicants respectfully submit that a subsequent rejection based on a newly cited reference, in the next official communication, cannot be a final rejection.

² Specification, page 1, lines 18-20.

³ Specification, page 2, line 5 – page 3, line 9.

⁴ Specification, page 3, lines 14-18.

⁵ Specification, page 19, line 26 – page 20, line 1.

⁶ Specification, page 20, lines 1-13.

4 detects the reference mark 12, the image processing mark 10 is imaged at its current position.⁷ The imaged position 9 of the image processing mark 10 reveals a rotational phase difference between the respective printing roller 11 and the reference printing roller 13.⁸

The outstanding Office Action cites Matsuo as teaching the claimed first rotating body, mark sensor, and first camera; Busch as teaching the claimed first mark; and Rieder as teaching the claimed second rotating body and second mark.⁹ Further, the Office Action states the following motivation for combining the references:

Since Matsuo discloses a rotating body with a means for detecting the rotation of the moving body by detection of the pinhole located on the body and then transmitting the information to a rotational angle measurement device *such that it's signal can be displayed*, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a marker, as disclosed by Busch, as a means *for ensuring that rotational angle [of a rotating body] can be compared with another rotating body* and visually determine whether the rotating bodies are rotating at the same speed.¹⁰

First and foremost, Applicants note that it is no import whether the references teach the display of a signal representing the rotation of a rotating body. As Claim 1 recites that the second mark is imaged and displayed in response to detection of the first mark, that feature must be taught by the proposed combination of references. The proposed combination does not teach the imaging and display of a mark, nonetheless the imaging and display of a first mark in response to the detection of a second mark on another rotating body.

In addition, Applicants note that the Office Action's interpretation of the applied references appears to be incorrect. Applicants presume the Office Action is combining the applied references as follows: (1) asserting Matsuo as teaching the detection of a rotating mark in order to configure a signal indicating the rotational speed (i.e., frequency) and angle (i.e., phase) of the rotating body bearing the mark; (2) asserting Busch as teaching the

⁷ Specification, page 20, lines 17-23.

⁸ Specification, page 20, line 24 – page 21, line 3.

⁹ Office Action, 326/2004, page 3.

¹⁰ Office Action, 3/26/2004, page 3.

rotating mark; and (3) asserting Reider as teaching the comparison of first and second rotating bodies.

Regarding the first assertion (1), Matsuo does not teach detection of the rotational angle of a rotating body. Rather, Matsuo only teaches detection of the rotational speed. More particularly, in Matsuo, the pulse signal b is generated each time one of the 10,000 identical pinholes (on the disk's periphery) is detected by the photodetector.¹¹ Thus, even when the pulse signal b is divided by 10,000 in order to generate one pulse per rotation,¹² the rotational angle of the pinhole disk cannot be determined because the pinholes are indistinguishable from one another and because none of the pinholes are associated with a particular rotational position.

Regarding the second assertion (2), Applicants presume the Office Action proposes incorporating the teachings of Busch to cure this deficiency. However, Busch does not teach the detection of a rotational angle. Rather, Busch teaches the determination of the mark's transverse position along the axis of rotation of the rotating body.¹³

Regarding the third assertion (3), Reider does not teach the comparison of two rotating bodies. Rather, Reider teaches a system of detecting the number of rotations of a first disk based on the rotational angle of a second disk.¹⁴ It bears mention that the rotational phase differences of those disks are never compared, as well.

Applicants realize the Office Action may be asserting simply that the desire to compare the rotational angle of two rotating bodies would provide sufficient motivation to combine the three applied references. However, since none of the applied references address such a comparison, Applicants respectfully submit that none of the references suggest the desirability (i.e. provide motivation) to compare the rotational phase difference of two

¹¹ Matsuo, col. 6, lines 57-61.

¹² Matsuo, col. 6, line 62 – col. 7, line 3.

¹³ Busch, col. 2, lines 28-31.

¹⁴ Reider, col. 3, line 45 – col. 4, line 3.

rotating bodies. Thus, Applicants respectfully request citation of a passage within one of the references that suggests one skilled in the art would desire to conduct such a comparison.

Accordingly, for the reasons stated above, Applicants respectfully request that the rejection of Claims 1-5, 7, 9-11, and 16-18, under 35 U.S.C. § 103(a) as unpatentable over Matsuo, Busch, and Rieder, be withdrawn.

New Claims 23-26 are added to set forth the claimed invention in a varying scope. More particularly, new independent Claims 23 and 24 correspond to independent Claim 1, but further distinguish over the applied reference by reciting the feature of a reference position displayed on the display section (Claim 23) and by clarifying that the second mark is imaged once each time the first rotating body completes a revolution (Claim 24).

New independent Claims 25-26 further recite that the rotating bodies are printing rolls, as do pending Claims 15 and 22. Applicants respectfully assert that this further limitation renders the applied references as non-analogous art. According to the MPEP:

In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.¹⁵

The applied references do not pertain to Applicant's field of endeavor.

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, *because of the matter with which it deals*, logically would have commended itself to an inventor's attention in considering his problem.¹⁶ Since the applied reference do not address detection of a rotational phase difference between two rotating bodies, they are not reasonably pertinent to the particular problem of which Applicants were concerned.

¹⁵ Ibid.

¹⁶ Ibid.

Even though the present application and the applied references teach components and problems of a common description (i.e., analyzing rotating bodies), that does not establish a sufficient nexus. In quoting the CAFC, the MPEP states:

The Board relied upon a reference which disclosed a hook and eye fastener for use in garments, *reasoning that all hooking problems are analogous*. The court held the reference was not within the field of applicant's endeavor, and was not reasonably pertinent to the particular problem with which the inventor was concerned because it had not been shown that a person of ordinary skill, seeking to solve a problem of *fastening a hose clamp*, would reasonably be expected or motivated to look to *fasteners for garments*. (emphasis added)¹⁷

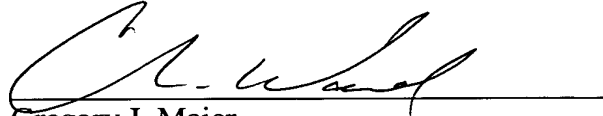
Just as all hooking problems are not analogous, neither are all problems related to rotating bodies. Thus, Applicants respectfully request clarification as to how the applied references address a rotational phase difference between two rotating bodies. Alternatively, Applicants respectfully request that the rejection of Claims 15 and 22, summarized above, be withdrawn; and not applied to new Claims 22 and 23.

¹⁷ Ibid. (quoting *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992)).

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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